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Sagamore Lens Focus on: FALMOUTH Groundwater Protection

GOVERNMENT DOCUMENTS
COLLECTION

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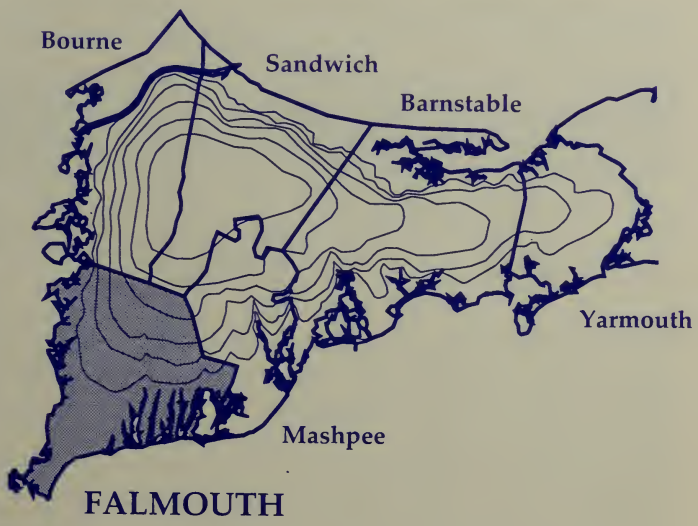
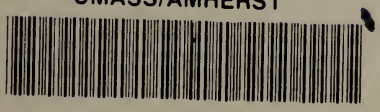
Water Resources Office
Cape Cod Commission



This map shows the Sagamore Lens water table in 10 foot contour intervals.

June 1996

UMASS/AMHERST



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What's this pamphlet all about?

Cape Cod is fortunate to have an abundant supply of high quality drinking water. This brochure answers frequently asked questions about ground water and discusses potential impacts from population growth on drinking water supplies. The information in this brochure is intended to familiarize residents of the town of Falmouth with local drinking water supply sources and what is being done to ensure they will remain safe for years to come.

Where does the water supply originate?

The Sagamore Lens is the source of fresh water for the town of Falmouth. This lens is one of the six groundwater lenses that make up the Cape Cod Sole Source Aquifer. Lenses can be thought of as mounds of groundwater bordered by marine water at the edge, bedrock on the bottom, and separated from each other by tidal waters, such as the Cape Cod Canal and Bass River, that cut across the Cape peninsula. Groundwater refers to subsurface water in soils and geologic formations that are fully saturated.

Groundwater in the Sagamore Lens is replenished from rain or snow that seeps into the ground. The water percolates through the soil to reach the water table, or surface of the groundwater lens. Water within the lens is always slowly moving towards the salt water where it discharges along the coast. Along the way, groundwater flows into and out of the numerous kettlehole lakes and ponds, and into streams feeding marine embayments along the coast.

The map on the next page shows the location of the Falmouth public drinking water supplies. The shaded areas represent the land area where the groundwater flow is diverted to the well instead of moving all the way to the shore. These areas are referred to as recharge areas, wellhead protection areas, or, if state approved, Zone II's. In Falmouth, these represent 50 year time of travel zones delineated using a computer groundwater model.

Falmouth Public Supply Wells

Massachusetts Military Reservation

Wellhead Protection Area

● Public Supply Well

* Future Supply Site

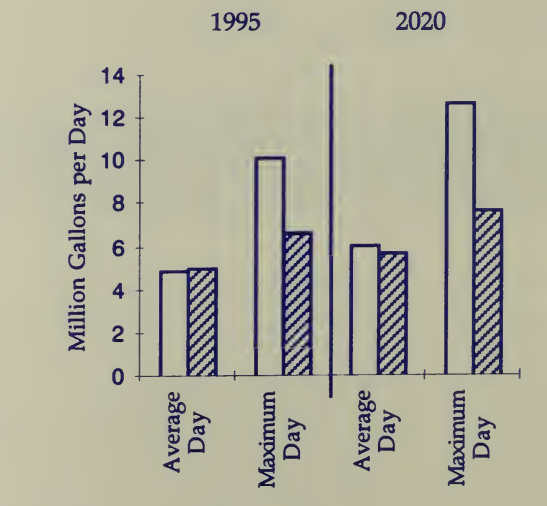
How much water does Falmouth use?

In 1995 the Falmouth Water Department pumped an average of 4,172,000 gallons per day from three wells and from Long Pond, the only surface water supply on Cape Cod. Approximately 85 percent of the population is served by public water. The remaining 15 percent use private wells. Additionally, water is used to irrigate golf courses, cranberry bogs and for other agricultural uses.

Is there enough water to supply the town in the future?

The town of Falmouth is always in the process of planning for future water supplies to meet its growing needs and to ensure an adequate supply if there is an emergency well closure. The following chart compares water demand and supply for existing and future conditions. The chart shows that the town of Falmouth is in immediate need of additional water supplies. Currently, one well is threatened by an Ethylene Dibromide contamination plume and has been taken off line pending construction of a wellhead treatment facility. The pumping capacity of Long Pond is restricted to avoid lower water levels and drawing in contamination from the landfill. Water restrictions and conservation are encouraged by the town to offset supply shortfall. Under severe summer demand conditions, these may become mandatory. The town has plans for a well site at Crooked Pond to meet present demand needs and is actively participating with the search for future supplies on the Massachusetts Military Reservation (MMR).

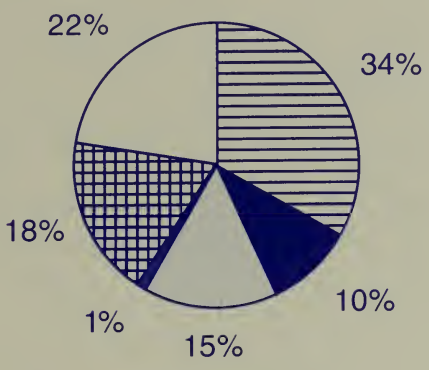
Falmouth Public Water Supply and Demand



Demand
(for planning purposes demand includes loss of largest supply)

Supply
Average day - wells pumping 18 hours
Maximum day - wells pumping 24 hours
(Maximum pumping can only be sustained for a short time.)

Falmouth Land Use Percentages



Source: 1995 Assessor's data

Residential	Commercial developable
Commercial/Industrial/ Agricultural	Undevelopable
Residential developable	Open space/Conservation

How can land use impact water supplies?

The chart above shows the distribution of land use in the town. Open space, which comprises 22 percent of the total land area in Falmouth, is beneficial to protect public water supplies from potential contamination sources. The Massachusetts Military Reservation lies to the North of the town. Past practices there have caused the closure of two Falmouth wells. Although the town cannot control land use practices on the MMR, the proposed adoption of a Groundwater Protection Policy by the MMR commanders may help to minimize future land uses that would be potentially inappropriate for water supplies. The town is currently 34 percent residential and 10 percent commercially developed. One of the greatest threats to water supplies is non-point source pollution from septic systems. Zoning bylaws protect these supplies by setting appropriate setbacks from supply wells and limiting septic system density in areas contributing to water supplies. The town landfill and sewage treatment plant impact a large area of groundwater that is continually monitored. Public water is provided to all the residents in this area. Water supplies may also be threatened from improper use and disposal of chemical products used in homes or businesses. Steps to

Groundwater Protection Regulations

	REGULATED BY:		
WATER SUPPLY	**STATE**	**COUNTY**	**TOWN OF FALMOUTH**
Groundwater Protection District	310 CMR 22.21(2)	RPP	Zoning
Private Well			
WASTEWATER/NUTRIENTS			
Individual Sewage Disposal Systems	310 CMR 15:00	DRI review	Board of Health
Wastewater Treatment Plants	310 CMR 5.00	DRI review	Zoning
Nutrient Loading	310 CMR 22.21/15:00	RPP/DRI review	Density/ Subdivision Rules
Stables			
HAZARDOUS MATERIALS			
Toxic and Hazardous Materials	310 CMR 22.21	RPP	Board of Health
Floor Drains	310 CMR 22.21		
Underground Storage Tanks	527 CMR 9.00		Board of Health
Herbicides/Pesticides	333 CMR		Zoning/Board of Health

CMR: Code of Massachusetts Regulations
Not regulated

RPP: Regional Policy Plan (Cape Cod Commission)
DRI: Development of Regional Impact

educate residents and businesses on proper disposal of these materials are the best defense from pollution. Periodically, the town holds a household hazardous waste collection to help minimize improper disposal of these materials.

What actions have been taken to protect water supplies?

The table shown above lists the water resource protection controls enforced at the local, county and state levels relating to wastewater and hazardous materials. Falmouth has many good regulations in place. It is the only town on Cape Cod with a coastal pond overlay district, which helps prevent excessive nutrient loading to fresh and coastal surface waters. Falmouth is one of the three communities on Cape Cod that has a public sewage disposal system.

What else can be done to safeguard future supplies?

There are several actions that can be taken to strengthen water supply protection efforts in the town. A board of health regulation prohibiting the use of floor drains in commercial buildings would reduce the risk of introducing contaminants into the groundwater and will bring the town's regulations into full consistency with state DEP wellhead protection regulations. Adoption of private well regulations should be considered. Falmouth should take an active role in encouraging the MMR to implement a groundwater protection policy that will safeguard the present and future water supplies of the communities of the Sagamore Lens.

How can I be sure that the water is safe to drink?

Public water supplies are tested monthly for bacteria, and annually for nitrate nitrogen and other organic and inorganic compounds specified by state and federal standards. If any problems are encountered, law requires public notice to be published in a local paper and the problem corrected. The water superintendent is always available to provide customers with copies of recent water quality results or to answer specific questions. The water supply is treated to control natural acidity and to protect public health from waterborne microorganisms. Average nitrate-nitrogen concentration for the water department is presently 0.62 parts per million, which is well below the state and federal limit of 10.

Private well water quality is the responsibility of individual property owners and should be tested regularly. Private wells may experience aesthetic problems such as staining and odor from high concentrations of iron or manganese. High levels of sodium, from salt water or road salt, are occasionally detected. Wells testing high in bacteria or nitrate-nitrogen may indicate too much fertilizer is being used or a septic system is too close to the well. High levels of nitrate should be monitored especially if pregnant women or infants are using the supply.

Water testing services are available at the Barnstable County Department of Health and the Environment Water Lab, located in the Superior Court Building on Route 6A in Barnstable Village. The charge for a routine analysis is $25 per sample and $75 for a volatile organic compound analysis. Sterilized containers must be used and are available at the lab and the health department.

For additional information on water supplies:

- Falmouth Water Department (508)548-7611
- Falmouth Health Department (508)548-7611
- Cape Cod Commission (508)362-3828
- Cape Cod Cooperative Extension (508)362-2511
- Barnstable County Dept. of Health and the Environment (508)362-2511
- Dept. of Environmental Protection - Southeast Regional Office (508)946-2760

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